

### **SUPPLEMENTAL EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Masako Ando on 16 July 2008.
3. The application has been amended as follows:

#### **Cancel Claims 11-14.**

This Supplemental Examiner's Amendment correctly identifies the claims to be cancelled as **Claims 11-14**.

#### **Replace the text of Claim 2 as follows:**

2. A plasma processing apparatus for processing a substrate, comprising:
  - a plasma processing chamber with chamber walls;
  - a substrate support within the chamber walls;
  - a plurality of confinement rings spaced apart from each other, and within and spaced apart from the chamber walls, wherein the confinement rings and the substrate support define a plasma volume; and
  - a magnetic source for generating a magnetic field for magnetically enhancing physical confinement provided by the confinement rings, the magnetic field having a

strength to bend a trajectory of a particle passing through the magnetic field but not having a strength to magnetically confine a plasma,

wherein the magnetic source comprises a first magnetic element spaced apart from and placed on a first side of the confinement rings, so that the first magnetic element is closer to the substrate support than the confinement rings, and a second magnetic element spaced apart from and placed on a second side of the confinement rings, so that the second magnetic element is farther from the substrate support than the confinement rings, wherein magnetic field lines passing from the first magnetic element to the second magnetic element pass through the confinement rings.

**Replace the text of Claim 3 as follows:**

3. The plasma processing apparatus, as recited in claim 2, wherein the magnetic source is configured such that the magnetic field passing through the confinement rings increases collisions of charged particles with the confinement rings.

**Replace the text of Claim 5 as follows:**

5. The plasma processing apparatus, as recited in claim 3, wherein the first magnetic element forms a ring shape with a diameter and the second magnetic element forms a ring shape with a diameter, and wherein the confinement rings have an inner diameter and an outer diameter, wherein the diameters of the first magnetic element and the second magnetic element are less than the outer diameter of the confinement rings and greater than the inner diameter of the confinement rings.

**Replace the text of Claim 7 as follows:**

7. The plasma processing apparatus, as recited in claim 2, wherein the magnetic fields pass through the region of the confinement rings.

**Replace the text of Claim 8 as follows:**

8. The plasma processing apparatus, as recited in claim 7, wherein the first magnetic element forms a ring shape with a diameter and the second magnetic element forms a ring shape with a diameter, and wherein the confinement rings have an inner diameter and an outer diameter, wherein the diameters of the first magnetic element and the second magnetic element are less than the inner diameter of the confinement rings.

**Replace the text of Claim 9 as follows:**

9. The plasma processing apparatus, as recited in claim 2, wherein the confinement rings are movable to define a variable gap, wherein the variable gap is used to vary pressure in the plasma volume.

**Replace the text of Claim 19 as follows:**

19. The plasma processing apparatus, as recited in claim 2, wherein each of the confinement rings has sides that form largest surfaces of the confinement ring wherein the magnetic field lines passing from the first magnetic element to the second magnetic element pass through the sides of the confinement rings that form largest surfaces of the confinement rings at an angle between being perpendicular to 45° with the sides of the confinement rings that form largest surfaces of the confinement rings.

**Replace the text of Claim 20 as follows:**

20. The plasma processing apparatus, as recited in claim 2, wherein the confinement rings, comprises a first confinement ring and a second confinement ring spaced from the first confinement ring, wherein the first magnetic element is placed on a first side of the first confinement ring and second confinement ring and is closer to the first confinement ring than to the second confinement ring and the second magnetic element is placed on a second side of the first confinement ring and second confinement ring and is closer to the second confinement ring than to the first confinement ring, and wherein magnetic field lines passing from the first magnetic element to the second magnetic element pass through the first confinement ring and the second confinement ring.

**Replace the text of Claim 22 as follows:**

22. The plasma processing apparatus, as recited in claim 21, wherein each of the confinement rings has sides that form largest surfaces of the confinement ring wherein the magnetic field lines passing from the first magnetic element to the second magnetic element pass through the sides of the confinement rings that form largest surfaces of the confinement rings at an angle between being perpendicular to 45° with the sides of the confinement rings that form largest surfaces of the confinement rings.

**Replace the text of Claim 24 as follows:**

24. The plasma processing apparatus, as recited in claim 2, wherein the first magnetic element is arranged in a ring shape having a first diameter and the second magnetic element is arranged in a ring shape having a second diameter different from the first diameter, and wherein the magnetic field lines passing from the first magnetic

element to the second magnetic element pass through the confinement rings in a canted manner.

**Replace the text of Claim 26 as follows:**

26. The plasma processing apparatus, as recited in claim 2, wherein the first magnetic element is provided near the inner edge of the confinement rings, and the second magnetic element is provided near the outer edge of the confinement rings.

***Reasons for Allowance***

**4. Claims 2, 3, 5-10, and 18-26 are allowed.**

The following is an examiner's statement of reasons for allowance: the prior art of record, whether alone or in combination, fails to teach or fairly suggest, in the context of Claim 2, a plasma processing apparatus comprising **a plurality of confinement rings** spaced apart from each other and within and spaced apart from the chamber walls; and **a magnetic source for generating a magnetic field for magnetically enhancing physical confinement provided by the confinement rings, *the magnetic field having a strength to bend a trajectory of a particle passing through the magnetic field but not having a strength to magnetically confine a plasma***; the magnetic source comprising first and second magnetic elements provided as recited in Claim 2 such that **magnetic field lines passing from the first magnetic element to the second magnetic element pass through the confinement rings.**

5. Applicant's arguments (see pages 8-9 of the Remarks filed 28 April 2008) against the combination of Imafuku and Lenz in regards to Claim 2 as amended were persuasive, specifically that Imafuku only teaches a magnetic source generating a

magnetic field that is by itself strong enough to magnetically confine the plasma, and that there is no teaching or suggestion in the prior art of record to additionally provide the confinement rings of Lenz in the apparatus of Imafuku while *also modifying the strength of the magnetic field of Imafuku* to be strong enough to bend a trajectory of a particle passing through the magnetic field *but not strong enough to magnetically confine the plasma*.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571)272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1792

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